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Docket No.: FL1049USPCT

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Amendments to Claims

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Claim 1-12 (Canceled)

MAR 19 2007

Claim 13. (New) A process for separating difluoromethane (HFC-32) from a first mixture comprising difluoromethane (HFC-32) and dichlorodifluoromethane (CFC-12), comprising the steps of:

contacting the first mixture with a hydrocarbon extractive agent having from 5 to 9 carbon atoms and having a normal boiling point greater than about 30°C and less than about 155°C to form a second mixture;

separating difluoromethane (HFC-32) from dichlorodifluoromethane (CFC-12) by distilling the second mixture in an extractive distillation zone; and

recovering difluoromethane (HFC-32) substantially free of dichlorodifluoromethane (CFC-12) as an overhead product, and recovering said extractive agent and dichlorodifluoromethane (CFC-12) from the bottom of said extractive distillation zone.

Claim 14. (New) The process of Claim 13 wherein the hydrocarbon extractive agent is selected from the group consisting of n-pentane, 2-methylpentane, 3-methylpentane, cyclopentane, methylcyclopentane, n-hexane, cyclohexane and n-heptane.

Claim 15. (New) The process of Claim 13 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 50 ppmw dichlorodifluoromethane (CFC-12).

Claim 16. (New) The process of Claim 13 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 0.1 ppmw dichlorodifluoromethane (CFC-12).

Claim 17. (New) A process for separating difluoromethane (HFC-32) from a first mixture comprising difluoromethane (HFC-32) and dichlorodifluoromethane (CFC-12), comprising the steps of:

contacting the first mixture with an extractive agent selected from the group consisting of:

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oxygen-containing extractive agents consisting of alcohols having a normal boiling point greater than about 60°C and less than about 100°C and represented by the formula $C_xH_{2x+1}OH$, wherein x is from 1 to 3, and ketones having a normal boiling point greater than about 50°C and less than about 110°C and represented by the formula $C_yH_{2y+1}COC_zH_{2z+1}$, wherein y and z are 1 or greater and $y+z$ is at most 5, and

chlorocarbon extractive agents consisting of chlorocarbons having a normal boiling point greater than about 39°C and less than about 150°C and represented by the formula $C_sH_{2s+2}Cl_t$, wherein s is 1 or 2 and t is from 2 to 4 to form a second mixture;

separating difluoromethane (HFC-32) from dichlorodifluoromethane (CFC-12) by distilling the second mixture in an extractive distillation zone; and

recovering difluoromethane (HFC-32) substantially free of dichlorodifluoromethane (CFC-12), together with said extractive agent from the bottom of said extractive distillation zone.

Claim 18. (New) The process of Claim 17 wherein the oxygen-containing extractive agent is selected from the group consisting of methanol, ethanol, propanol, iso-propanol, propanone, and butanone.

Claim 19. (New) The process of Claim 17 wherein the chlorocarbon extractive agent is methylene chloride.

Claim 20. (New) The process of Claim 17 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 50 ppmw dichlorodifluoromethane (CFC-12).

Claim 21. (New) The process of Claim 17 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 0.1 ppmw dichlorodifluoromethane (CFC-12).

Claim 22. (New) A process for separating difluoromethane (HFC-32) from a first mixture comprising difluoromethane (HFC-32) and 1,1,1-trifluoroethane (HFC-143a), comprising the steps of:

contacting the first mixture with a hydrocarbon extractive agent having from 5 to 9 carbon atoms and having a normal boiling point greater than about 30°C and less than about 155°C to form a second mixture;

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separating difluoromethane (HFC-32) from 1,1,1-trifluoroethane (HFC-143a) by distilling the second mixture in an extractive distillation zone; and

recovering difluoromethane (HFC-32) substantially free of 1,1,1-trifluoroethane (HFC-143a) as an overhead product, and recovering said extractive agent and 1,1,1-trifluoroethane (HFC-143a) from the bottom of said extractive distillation zone.

Claim 23. (New) The process of Claim 22 wherein the hydrocarbon extractive agent is selected from the group consisting of n-pentane, 2-methylpentane, 3-methylpentane, cyclopentane, methylcyclopentane, n-hexane, cyclohexane and n-heptane.

Claim 24. (New) The process of Claim 22 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 50 ppmw 1,1,1-trifluoroethane (HFC-143a).

Claim 25. (New) The process of Claim 22 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 0.1 ppmw 1,1,1-trifluoroethane (HFC-143a).

Claim 26. (New) A process for separating difluoromethane (HFC-32) from a first mixture comprising difluoromethane (HFC-32) and 1,1,1-trifluoroethane (HFC-143a), comprising the steps of:

contacting the first mixture with an extractive agent selected from the group consisting of:

ketones having a normal boiling point greater than about 50°C and less than about 110°C and represented by the formula $C_yH_{2y+1}COC_2H_{2z+1}$, wherein y and z are 1 or greater and $y+z$ is at most 5, and

chlorocarbon extractive agents consisting of chlorocarbons having a normal boiling point greater than about 39°C and less than about 150°C and represented by the formula $C_sH_{2s+2-t}Cl_t$, wherein s is 1 or 2 and t is from 2 to 4 to form a second mixture;

separating difluoromethane (HFC-32) from 1,1,1-trifluoroethane (HFC-143a) by distilling the second mixture in an extractive distillation zone; and

recovering difluoromethane (HFC-32) substantially free of 1,1,1-trifluoroethane (HFC-143a), together with said extractive agent from the bottom of said extractive distillation zone.

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Claim 27. (New) The process of Claim 26 wherein the ketone extractive agent is selected from the group consisting of propanone and butanone.

Claim 28. (New) The process of Claim 26 wherein the chlorocarbon extractive agent is methylene chloride.

Claim 29. (New) The process of Claim 26 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 50 ppmw 1,1,1-trifluoroethane (HFC-143a).

Claim 30. (New) The process of Claim 26 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 0.1 ppmw 1,1,1-trifluoroethane (HFC-143a).

Claim 31. (New) A process for separating difluoromethane (HFC-32) from a first mixture comprising difluoromethane (HFC-32) and chloropentafluoroethane (CFC-115), comprising the steps of:

contacting the first mixture with a hydrocarbon extractive agent having from 5 to 9 carbon atoms and having a normal boiling point greater than about 30°C and less than about 155°C to form a second mixture;

separating difluoromethane (HFC-32) from chloropentafluoroethane (CFC-115) by distilling the second mixture in an extractive distillation zone; and

recovering difluoromethane (HFC-32) substantially free of chloropentafluoroethane (CFC-115) as an overhead product, and recovering said extractive agent and chloropentafluoroethane (CFC-115) from the bottom of said extractive distillation zone.

Claim 32. (New) The process of Claim 31 wherein the hydrocarbon extractive agent is selected from the group consisting of n-pentane, 2-methylpentane, 3-methylpentane, cyclopentane, methylcyclopentane, n-hexane, cyclohexane and n-heptane.

Claim 33. (New) The process of Claim 31 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 50 ppmw chloropentafluoroethane (CFC-115).

Claim 34. (New) The process of Claim 31 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 0.1 ppmw chloropentafluoroethane (CFC-115).

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Claim 35. (New) A process for separating difluoromethane (HFC-32) from a first mixture comprising difluoromethane (HFC-32) and chloropentafluoroethane (CFC-115), comprising the steps of:

contacting the first mixture with an extractive agent selected from the group consisting of:

oxygen-containing extractive agents consisting of alcohols having a normal boiling point greater than about 60°C and less than about 100°C and represented by the formula $C_xH_{2x+1}OH$, wherein x is from 1 to 3, and ketones having a normal boiling point greater than about 50°C and less than about 110°C and represented by the formula $C_yH_{2y+1}COC_zH_{2z+1}$, wherein y and z are 1 or greater and y+z is at most 5, and

chlorocarbon extractive agents consisting of chlorocarbons having a normal boiling point greater than about 39°C and less than about 150°C and represented by the formula $C_sH_{2s+2-t}Cl_t$, wherein s is 1 or 2 and t is from 2 to 4 to form a second mixture;

separating difluoromethane (HFC-32) from chloropentafluoroethane (CFC-115) by distilling the second mixture in an extractive distillation zone; and

recovering difluoromethane (HFC-32) substantially free of chloropentafluoroethane (CFC-115), together with said extractive agent from the bottom of said extractive distillation zone.

Claim 36. (New) The process of Claim 35 wherein the oxygen-containing extractive agent is selected from the group consisting of methanol, ethanol, propanol, iso-propanol, propanone, and butanone.

Claim 37. (New) The process of Claim 35 wherein the chlorocarbon extractive agent is methylene chloride.

Claim 38. (New) The process of Claim 35 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 50 ppmw chloropentafluoroethane (CFC-115).

Claim 39. (New) The process of Claim 35 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 0.1 ppmw chloropentafluoroethane (CFC-115).